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# *Gymnothorax eurygnathos*, a new moray from the Gulf of California (Anguilliformes: Muraenidae)

Eugenia B. Böhlke †

Academy of Natural Sciences of Philadelphia 1900 Benjamin Franklin Parkway, Philadelphia, PA 19103-1195. FAX 215-299-1028. † Deceased.

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**Abstract**. A new species of moray eel from deep water in the Gulf of California is described. It is dark brownish-black with an overall pattern of pale irregular blotches; a short, broad head; wide, triangular jaws; deeply serrate and partially biserial teeth; dorsal-fin origin above and behind gill opening; and 10 predorsal, 66 preanal, and 134 total vertebrae. This combination of characters is not shared by any other moray species.

**Key words**: New species, *Gymnothorax*, Muraenidae, Pisces, Gulf of California

In 1973 a strange moray collected in deep waters in the Gulf of California was sent to the late James E. Böhlke for identification. It appeared to be a new species; data were taken and it was illustrated, but the description was postponed in the hope that additional specimens might be found, and to allow comparison with several poorly-known species of morays. However, no additional specimens have been taken, nor has any specimen resembling it been found during years of study of moray species by the author, including reexamination of the types of most nominal species. It is here described as new.

## MATERIALAND METHODS

Methods and terminology are as defined in Böhlke (1989). Proportions are expressed in terms of total length (TL), measured from the snout tip to the tip of the tail, or head length (HL), from snout tip to the posterodorsal margin of the gill opening. Preanal length is measured from snout tip to mid-anus; body depth is measured at the gill opening and at the anus and does not include the fins; snout length is measured from snout tip to the anterior margin of the eye; upper-jaw length is from snout tip to the external inner angle of the mouth, lower-jaw length from tip of lower jaw to the external inner angle of the mouth. Vertebral counts are obtained from radiographs as explained in Böhlke (1982); the vertebral formula (VF) is expressed as predorsal - preanal - total count, the mean vertebral formula (MVF) as the means of those counts. Tooth counts are approximate and include sockets of missing teeth. Institutional abbreviations follow Leviton *et al*. (1985).

*Gymnothorax eurygnathos* **new species**
Wide-jaw moray
(Figs. 1-2)

**Holotype**: SIO 72-199, 469 mm TL; Mexico, Gulf of California, 26°11.4-15.5”N, 109°50.7-39.5’W, by otter trawl from bottom at 406-396 m; R/V ALEJANDRE VON HUMBOLDT 72/03; 21 Feb. 1972.

**Diagnosis**: A stout cylindrical *Gymnothorax* with overall dark coloration patterned with small pale blotches; tail short, preanal length 1.74; head massive and broad, 6.95 in TL; depth at gill openings 12 in TL; dorsal-fin origin above and behind gill opening; teeth short, stout, and deeply serrate, partially biserial; VF 10-66-134.

**Measurements in mm and counts for holotype**: TL 469; preanal length 270; HL 67.5; predorsal length ca. 88.3; depth at gill opening 40.5; depth at anus 25.2; length upper jaw 22.2; length lower jaw 23.4; snout length 12.1; eye diameter 3.3; width interorbital 11.2. Head pores: branchial 2; supraorbital 2 (ethmoid) + 2; infraorbital 5/4; mandibular 7/6. Outer intermaxillary teeth 5/5, main intermaxillary teeth 5/5, 1 median tooth; maxillary teeth 9/7; vomerine teeth 7, staggered; main dentary teeth 13/14, outer dentary teeth 9/6. Predorsal vertebrae 10, preanal vertebrae 66, total vertebrae 134.

**Description**. A moderately large, stout moray with broad head and swollen thorax; depth at gill opening 12, depth at anus 19 in TL. Anus well behind midbody, preanal length 1.74 in TL. Head broad and massive, 6.95 in TL; snout short, 5.58 in HL. Jaws short and wide, upper jaw 3.04 in HL, lower jaw projecting slightly beyond upper, 2.88 in HL. Eye very small, 20.4 in HL. Anterior nostrils in short tube, the left nostril double with a second, shorter tube anteroventral to the main nostril (probably aberrant); posterior nostril a pore above and before anterior margin of eye. Head pores (Fig. 2A) with some variation from the typical condition found in *Gymnothorax* species; two pores on each side at tip of snout, the second between anterior nostrils (Fig. 2B) (not previously seen on any moray), rather than the usual single ethmoid pore, plus the typical two supraorbital pores on the dorsal snout; 5 infraorbital pores along left side of the upper jaw, the posteriormost a double pore, the usual 4 on the other side; 7 mandibular pores along left side of lower jaw, the usual 6 on the right. Two small branchial pores above and well before gill opening. The exact point of the dorsal-fin origin is not discernable externally, but the radiograph indicates it is above the 10th vertebra, above and shortly behind gill opening. Gill opening large and distended.

Teeth moderately short, stout and triangular, canted back, deeply serrate on both sides, with posterior basal knob; many teeth missing or broken, counts are approximate and include sockets (diagrammed as teeth in Fig. 2B). Main intermaxillary series of 5 stout serrate teeth, about 5 very small, rounded, outer teeth, and 1 median tooth anteriorly which is serrate laterally. Maxillary teeth in one row of 7-9 stout serrate teeth, becoming slightly smaller posteriorly. Vomerine teeth short and sharp, 7 teeth in staggered row, the median 2 opposed. Main series of about 13-14 dentary teeth, all stout and serrate and slightly decreasing in size posteriorly, plus irregular outer row of 6-9 small rounded teeth.

Color of head, body and fins uniformly dark brownish-black, with small, pale, lichenous blotches; some of the blotches coalesce at the margin of dorsal fin but they do not form a uniform pale margin.

**Etymology:** From the Greek *eury* (wide) and *gnathos* (jaw), in reference to the wide jaws, to be treated as a noun in apposition.

**Distribution:** Known only from the holotype collected by otter trawl in the Gulf of California at a depth between 396 and 406 m.

**Remarks:** The new species is placed in the genus *Gymnothorax*, as defined in Böhlke et al. (1989:145). During ongoing studies of species of morays, it has become obvious that the generic classification of the subfamily

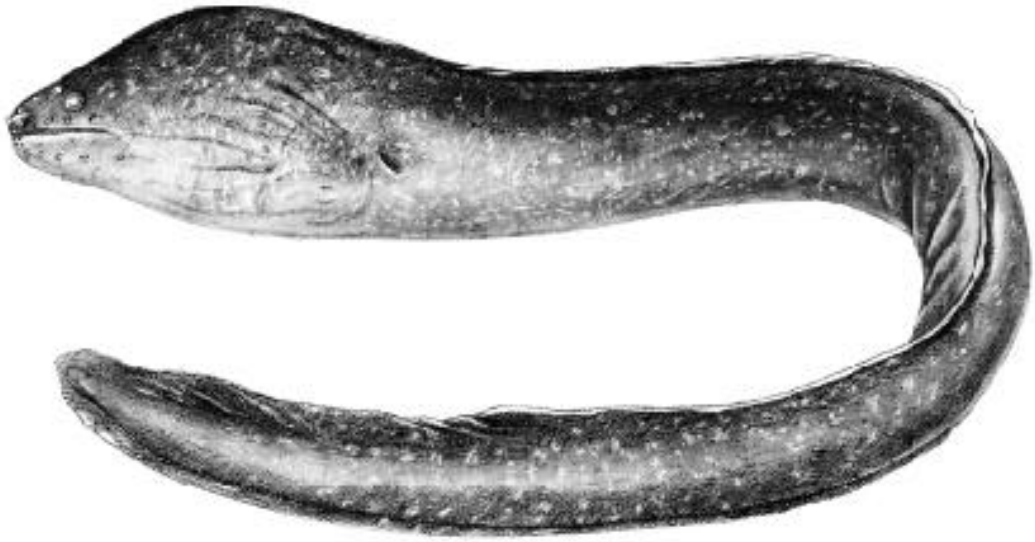

Fig.1. *Gymnothorax eurygnathos*, SIO 72-199, holotype, 469 mm, from the Gulf of California; illustration by Mary H. Fuges.

Muraeninae is highly erratic and unreliable, and in dire need of comprehensive study. Until such a study is completed, and to avoid further complicating future nomenclatural changes, recent generic placement has followed rather inconsistent recent usage. The subfamily Uropterygiinae currently contains four genera which have been well characterized and are generally accepted: *Anarchias, Channomuraena, Scuticaria,* and *Uropterygius*. In contrast, muraenins are placed in nine genera which are defined by various, specific, historical characters (some of questionable of generic merit) (*Echidna, Enchelycore, Enchelynassa, Gymnomuraena, Monopenchelys, Muraena, Pseudechidna, Rhinomuraena,* and *Strophidon*), with a majority of the species lumped together in the catch-all genus *Gymnothorax* sensu lato, with 14 names in its synonymy. The new species is placed in *Gymnothorax* based on general appearance, dentition, pore, and nostril conditions. This combination of characters is not shared with any other moray species, and the species most certainly does not belong in any of the other currently recognized genera.

*Gymnothorax eurygnathos* is most distinctive: the head is short and broad, the jaws wide and triangular; the teeth are unique in their form and by possessing very deep serrations; the short tail and the posterior position of the dorsal-fin origin are both reflected in the vertebral formula of 10-66-134 which is unlike that of any other moray species. Color patterns are highly variable in morays, and, based on coloration, the new species might casually be identified in the field as *G. mordax* (Ayres, 1859), an eastern Pacific species with dark, marbled coloration (but with smooth teeth and MVF of 5-65-148). Four other eastern Pacific *Gymnothorax* have serrate teeth: *G. angusticeps* (Hildebrand and Barton, 1949) (with uniform brown coloration and MVF of 6-73-169, known from only two specimens); *G. equatorialis* (Hildebrand, 1946) (brown with well-spaced white

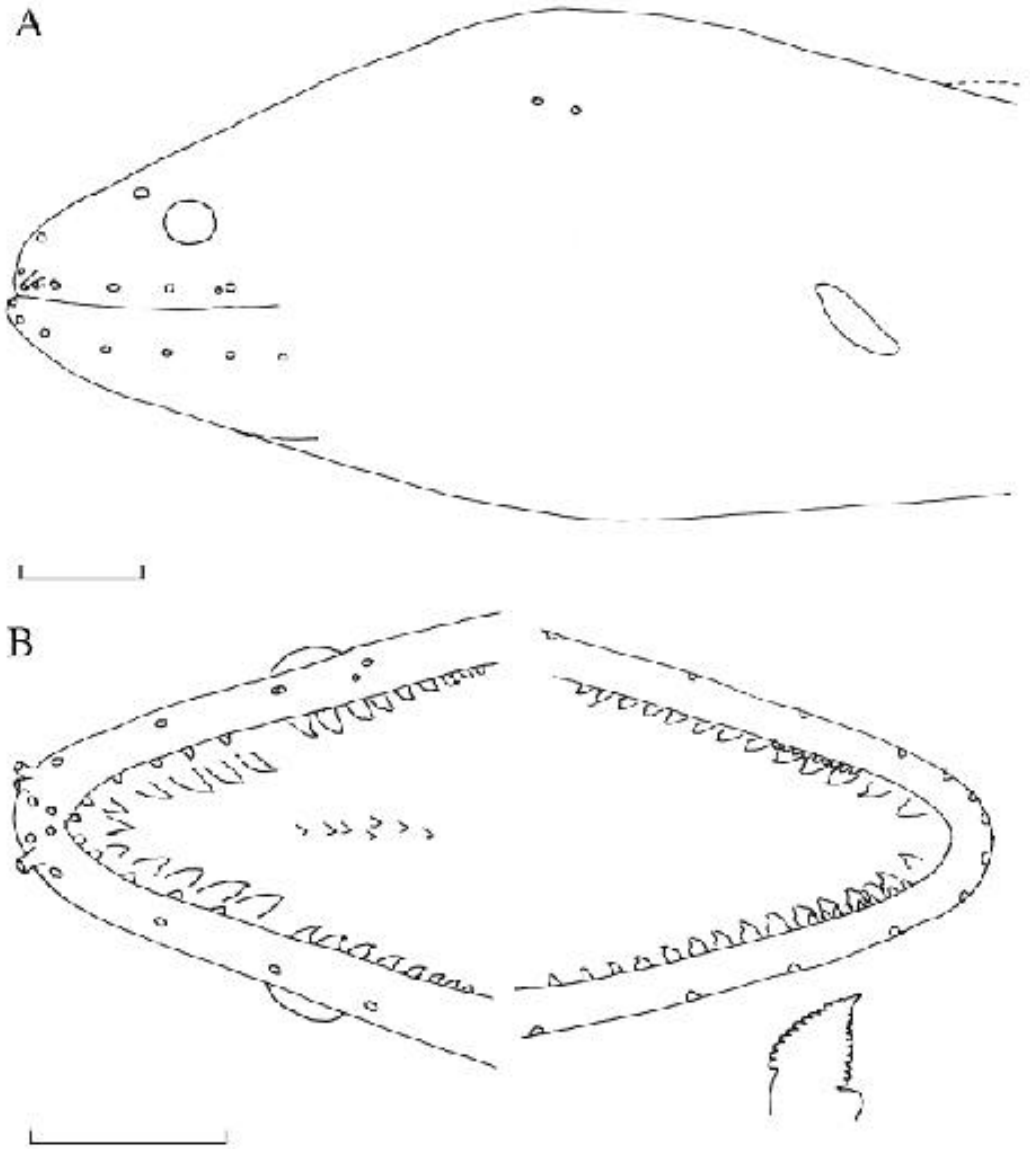


Fig.2. A. *Gymnothorax eurygnathos*, SIO 72-199, holotype, 469 mm. A. Diagram of head; line = 10 mm.
B. Diagram of dentition; inset shows detail of highly serrate tooth; line = 10 mm.

spots and dark tail, MVF 7-53-146, a common species); *G. phalarus* Bussing, 1998 (with small white spots on uniform brown body and tail, MVF 6-59-142, also a common species), and *G. serratidens* (Hildebrand and Barton, 1949) (brown with rows of pale spots, VF 8-68-156, known only from the holotype). *Gymnothorax eurygnathos* is distinguished from all of these by the position of the dorsal-fin origin, the short tail, the wide jaws and very highly serrate teeth, and the vertebral count.

The holotype has several characters which might be anomalous (the double ethmoid pores, the additional infraorbital and mandibular pores, and, most likely, the double anterior nostril on the left side), or an artifact of collection (the swollen condition of the head and thorax, the enlarged gill opening); their status can be determined only when additional specimens are obtained.

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## RESUMEN

Se describe una nueva especie de anguila morena de profundidad del Golfo de California, cuya combinación de color, dentadura y vertebras es distintiva de cualquier otra especie de morena.

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